

**STATEMENT OF TORRENCE H. ROBINSON  
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**BEFORE THE  
SUBCOMMITTEE ON BASIC RESEARCH  
OF THE  
COMMITTEE ON SCIENCE  
UNITED STATES HOUSE OF REPRESENTATIVES**

**TUESDAY, MARCH 30, 2004**

Good morning Mr. Chairman, Congresswoman Johnson and members of the Subcommittee; my name is Torrence Robinson and I am Director of Public Affairs for Texas Instruments. I am pleased to be here today to comment on the Congressional Medal for Outstanding Contributions in Math and Science Education Act and to talk about TI's perspective on K-12 math and science education.

First, I'd like to commend this Committee for all its work over the last several years to improve math and science education in the United States and to excite more children to embrace and explore these disciplines of study. As you well know, America's economic and national security is inextricably linked to our technological advancement. And that advancement depends on educating the future scientists, engineers and mathematicians that will develop the new tools, designs and manufacturing and information systems that will secure and promote America's competitive edge.

**Congressional Medal for Outstanding Contributions to Math and Science**

Texas Instruments supports the Committee's efforts to acknowledge those companies and organizations that provide exemplary contributions to K-12 math and science education. In doing this, you have an excellent opportunity not only to highlight and help disseminate effective programs, but also to help align both philanthropic and for-profit efforts toward a common objective. Companies are driven by results in almost everything we do, but when it comes to philanthropic giving, the business community is still in an evolutionary mode. Increasingly companies are trying to seek out and support those programs that are effective and yield real results, while moving away from those programs that may not meet the bar. This legislation can help push that effort to a higher level.

We are very pleased that the proposed legislation contemplates recognizing a small number of programs annually, as we believe that will drive excellence and promote recognition of only the best.

We are also pleased that the selection criteria give priority consideration to those programs with evidence of improved student achievement. That must be the ultimate goal.

We applaud those provisions that require real metrics, such as a demonstration of increased interest by students in science, technology, engineering and mathematics as evidenced by an increase in the number of students enrolled in advanced courses related to such fields. Metrics that merely present numbers of students, teachers or employees who are touched/involved in these disciplines or that focus on “soft outcomes” are not sufficient.

In that vein, we would like to suggest other criteria that we feel would help this program be a catalyst for excellence:

1. Require that the program demonstrate how it supports and/or builds upon state standards in mathematics and/or science. Programs that do not support or enhance state standards can be a distraction to schools trying to comply with the requirements of No Child Left Behind, particularly in low performing schools. Mike Moses, the Superintendent of Schools for the Dallas Independent School District calls unaligned programs “random acts of kindness” that while well-intentioned, do not move the ball any closer to the ultimate goal.
2. Require programs that involve professional development to tie into the No Child Left Behind requirement ensuring that teachers are highly qualified. Study after study demonstrates that teacher quality is a key determinant of student success. Private sector efforts should support that goal.
3. Require that programs be replicable and identify the key elements for successful implementation.
4. Require that the recognized programs show at least three years of sustainable results.
5. Strengthen the criteria around employee interaction with students and teachers to ensure some demonstrable result, i.e., increased test scores, students taking tougher courses, etc.
6. Require that programs that promote career awareness show clear linkages to standards and to demonstrable results.

America is at a crossroads, both in terms of how it responds to the competitive pressures of a worldwide economy and in terms of the focus and priority it gives to ensuring that all students are prepared with the math, science and literacy skills needed to succeed in that economy. Business, government and the academic establishments need to work together, now more than ever, to ensure that we are achieving the right goals and that we are equipping our children with the world-class education they need. This legislation can be an effective tool in aligning private sector resources around this objective.

## Texas Instruments and K-12 Education

The importance TI places on K-12 math and science education is due in part to our corporate culture and to the changing skills and levels of education we require of our technical workforce. TI Founders understood the need for highly skilled engineering talent to support the company's growth and competitiveness. As a result they founded what later became the University of Texas at Dallas in 1961 to help supply the North Texas region and the company with master's level graduates in engineering. Today the vast majority of our investment in higher education is directed toward research or the development of a technical workforce in science, technology, engineering and mathematics.

Our hiring challenges and our involvement in public policy at the local, state and national levels, however, made it clear to us that in order to support long-term growth and improve our competitiveness in a worldwide marketplace it was imperative that we invest in the K-12 education pipeline. And we have been doing so now for many years. In addition to the direct benefit of providing a highly qualified workforce, TI believes that having a high quality education system helps to strengthen the overall quality of life in our plant site communities.

TI hires employees with skills at different levels, but our needs are evolving. Semiconductor manufacturing has migrated from the era of placing a high value on manual dexterity on the assembly line to one of mental dexterity on the clean room floor. A TI manufacturing specialist must have a basic knowledge of math and science skills. Our technicians must have an associates' degree in semiconductor manufacturing technology and pass a comprehensive test that covers basic electronics, applied physics and basic chemistry.

In addition, because of the continuing complexity of the design process and other technological advances, more is expected from engineering graduates in terms of the breadth of their engineering coursework exposure and experiences at all levels of higher education—BS, MS and Ph.D.

In our K-12 activities we look to create opportunities for educational improvement by developing and supporting programs that yield measurable results and that can be replicated elsewhere. I have highlighted two for discussion today:

**The Infinity Project**<sup>SM</sup> is a math and science-rich engineering curriculum for high school students created in collaboration between the Institute for Engineering Education at Southern Methodist University and TI. It is achieving success by helping change student attitudes towards math, science and engineering by exciting students about real world technology applications that are relevant to their lives, such as cell phones, MP3 players, digital special effects in movies and much more. This full-year curriculum is helping both students and teachers answer the age-old question, "Why do I need to learn this math?" By linking fundamental mathematical concepts found in algebra 2 (like polynomials and matrices) to the fascinating and cool applications,

students are better prepared and motivated to pursue higher level math and science courses and to consider pursuing engineering and technical degrees.

A hallmark of the program's early success has been the open communication between the Infinity Project and classroom teachers as the curriculum was developed and as it continues to be implemented. That two-way "give and take" has provided a deep understanding of student, teacher, principal and district administrator needs.

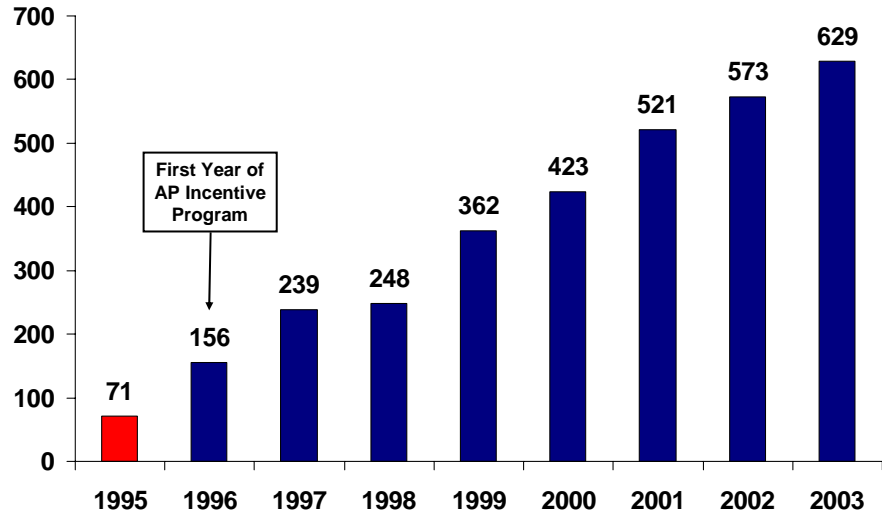
The Infinity Project is in its third year and has been introduced in several schools across Texas and in 19 other states. Early data indicates that 65 percent of the students who complete the course say they are interested in pursuing engineering in the future. Nationally only 2 percent of the graduating high school population goes on to receive an engineering degree. We hope that Infinity will help boost those numbers. A more detailed, multi-year qualitative assessment of the program and its impact on student achievement and post-secondary technical discipline enrollment rates will begin in the fall 2004.

**Advanced Placement Strategies, Inc.** is a non-profit organization that works with Texas schools and the private sector to plan and manage Advanced Placement (AP®) and Pre-AP® incentive programs for teachers, students and schools. The program was created by the O'Donnell Foundation and is currently supported by the Texas Instruments Foundation and others. The program is designed to encourage students to take more rigorous college-level course work in high school, which prepares them for success in post-secondary education, as well as high-tech careers. The program provides financial incentives to teachers and students that are based upon achieving academic results, namely passing the AP test. Other program components include Pre-AP teacher preparation and support; student support, including tutoring, prep sessions and summer academies; and student exam fees for AP and PSAT® exams.

As a result of the AP Incentive program operated in the Dallas Independent School District, the 10 DISD Incentive Schools have seen the number of passing scores for all students in math and science grow 786 percent from pre-incentive program levels (from 71 students passing in 1995 to 629 passing in 2003).

## AP Passing Scores

Scores of 3 and Over in Math and Science in 10 DISD Incentive Schools  
For All Students



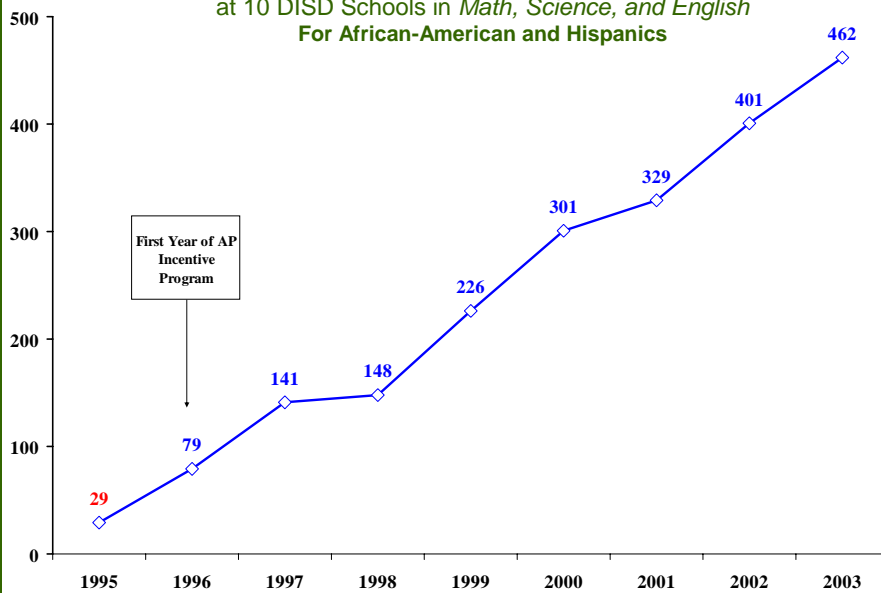
Source: The College Board

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In addition the number of passing scores for African-American and Hispanic students in math, science and English has grown 1493 percent from pre-incentive program levels (29 students passing in 1995 to 462 in 2003).

## AP Passing Scores

at 10 DISD Schools in *Math, Science, and English*  
For African-American and Hispanics



Note: 2003 numbers are preliminary  
Source: The College Board, DISD

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It is no secret which academic coursework is needed to develop the background that good engineers need to compete in the global marketplace. Engineers require extensive K-12 instruction in mathematics, science and technology, in particular, courses such as algebra 2, calculus, physics, computer science, English, and if they can find it, an actual course in engineering. It is through these academic experiences that students become proficient in thinking critically, solving problems and communicating effectively.

TI engages in a number of other programs in our communities to advance educational excellence. And our graphing technology business, which is well known in middle and high school classrooms, also gears its professional development activities toward achieving results. The discipline of the No Child Left Behind Act and its requirement for evidence of effectiveness in raising student achievement has been an important tool in focusing schools, teachers, students and businesses on meeting that objective.

Again, I want to commend the Committee for its tireless work in support of math and science excellence. I am happy to answer any questions you might have.